

The African Organisation for Standardisation

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ARS 929 (2012) (English): Leafy
vegetables -- Specification



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Leafy vegetables — Specification



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Foreword

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This African Standard was prepared by the ARSO Technical Harmonization Committee on Agriculture and Food Products (ARSO/THC 1).

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Introduction

Green leafy vegetables provide a powerful source of vitamins, minerals, antioxidants and phytonutrients. Green leafy vegetables are a significant source of Vitamin A, C, E and K - as well as several B Vitamins. Greens are also the richest sources of minerals including calcium, magnesium, iron and potassium. Most importantly they are rich in fibre (which aids in digestion and weight loss), extremely low in fats and carbohydrates, and provide an excellent source of protein.

Draft African Standard for comments only — Not to be cited as African Standard

Leafy vegetables — Specification

1 Scope

This standard applies to leafy vegetables of varieties (cultivars) grown from the following species to be supplied fresh to the consumer, leafy vegetables for industrial processing being excluded:

- (a) watercress (*Nasturtium officinale* R. Br.)
- (b) rocket (*Eruca sativa* Mill., *Diplotaxis tenuifolia* (L.) DC. and *Diplotaxis muralis* (L.) DC.)
- (c) spinach (*Spinacia oleracea* L.)
- (d) turnip tops or turnip greens (*Brassica rapa* L. Rapa Group)
- (e) broccoli raab or ruvo kale (*Brassica rapa* L. Broccoletto Group)
- (f) beet greens (chard) (*Beta vulgaris* subsp. *cicla* (L.) W.D.J. Koch Flavescens Group).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 44, *Recommended international code of practice for the packaging and transport of tropical fresh fruits and vegetables*

CAC/RCP 53, *Code of hygienic practice for fresh fruits and vegetables*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 874, *Fresh fruits and vegetables — Sampling*

ISO 2169, *Fruits and vegetables — Physical conditions in cold stores — Definitions and measurement*

ISO 6561-1, *Fruits, vegetables and derived products — Determination of cadmium content — Part 1: Method using graphite furnace atomic absorption spectrometry*

ISO 6561-2, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

ISO 6633, *Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6634, *Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

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ISO 6637, *Fruits, vegetables and derived products — Determination of mercury content — Flameless atomic absorption method*

ISO 7563, *Fresh fruits and vegetables — Vocabulary*

ISO 7952, *Fruits, vegetables and derived products — Determination of copper content — Method using flame atomic absorption spectrometry*

ISO 9526, *Fruits, vegetables and derived products — Determination of iron content by flame atomic absorption spectrometry*

ISO 17239, *Fruits, vegetables and derived products — Determination of arsenic content — Method using hydride generation atomic absorption spectrometry*

3 Definitions

For the purposes of this standard, the terms and definitions in ISO 7563, and the following terms and definitions apply.

3.1 Bunched

3.1.1

similar varietal characteristics

the spinach shall be of one type, such as crinkly leaf type or flat leaf type. No mixture of types shall be permitted which materially affects the appearance of the bunch.

3.1.2

same form

bunches and containers shall contain either plants or leaves with no more than a 15 per cent by weight mixture of the other in either the bunch or the container

3.1.3

well grown

not stunted or poorly developed

3.1.4

fairly clean

generally free from dirt, sand or other adhering foreign matter and the appearance of the bunch is not materially affected

3.1.5

reasonably clean

mostly free from dirt, sand or other adhering foreign matter and that the appearance of the bunch is not seriously affected

3.1.6

well-trimmed

for plants that the roots are no longer than 25 mm below the common point of attachment of the leafstems, and for leaves that not more than 15 per cent of the leaves in the bunch have leaf stems longer than the length of the attached leaf.

3.1.7

fairly well trimmed

for plants the roots are no longer than 50 mm below the common point of attachment of the leaf stems, and for leaves that not more than 15 per cent of the leaves in the bunch have leaf stems longer than one and one-half times the length of the attached leaf

3.1.8

fresh

not more than slightly wilted

3.1.9**damage**

any specific defect described in this section or an equally objectionable variation of any one of these defects, or any other defect or any combination of defects which materially detracts from the appearance or edible or marketing quality. The following specific defects shall be considered as damage:

- (1) Seedstems when more than one-fourth the length of the longest leaf in the bunch.
- (2) Flower buds when mostly opening in the bunch.
- (3) Insects when scattered or concentrated or when insect feeding materially affects the appearance of the bunch.
- (4) Discoloration when affecting an aggregate area of more than 10 per cent of the total surface area of the leaves in the bunch.
- (5) Mechanical damage when more than 25 % of the leaves in the bunch are crushed, torn or broken.

3.1.10**serious damage**

any specific defect described in this clause or an equally objectionable variation of any one of these defects, or any other defects or any combination of defects which seriously detracts from the appearance or the edible or marketing quality. The following specific defects shall be considered as serious damage.

- (1) Seedstems when more than one-half the length of the longest leaf in the bunch.
- (2) Flower buds when generally open in the bunch.
- (3) Insects when very concentrated or when the insect feeding seriously affects the appearance of the bunch.
- (4) Discoloration when affecting an aggregate area of more than 25 percent of the total surface area of the leaves in the bunch.
- (5) Mechanical damage when more than 50 percent of the leaves in the bunch are crushed, torn or broken.

3.2 Plants**3.2.1****similar varietal characteristics**

the spinach shall be of one type, such as crinkly leaf type or flat leaf type. No mixture of types shall be permitted which materially affects the appearance of the spinach in the container.

3.2.2**well grown**

the plants are not stunted or poorly developed

3.2.3**fresh**

the spinach is not more than slightly wilted

3.2.4**fairly clean**

the individual spinach plant is reasonably free from dirt or other adhering foreign matter, and that the general appearance of the spinach plants in the container is not materially affected

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3.2.5

well-trimmed

the spinach plant is cut at the crown of the root, or cut so that the root is not longer than 25 mm

3.2.6

damage

any defect which materially affects the appearance, or the edible or shipping quality of the individual plant, or the general appearance of the spinach in the container. Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

- (a) Coarse central stalks or seedstems when causing more than 10 percent waste of the individual plant; or when the flower buds are plainly visible;
- (b) Discoloration when materially affecting the general appearance of the plant, except that heart leaves which are yellow or partially blanched shall not be considered as damaging the plant; and
- (c) Foreign material when materially affecting the edible quality, or the general appearance of the spinach in the container. Foreign material means weeds, grass, or any loose material other than spinach.

3.2.7

serious damage

any defect which seriously affects the appearance, or the edible or shipping quality of the individual plant, or the general appearance of the spinach in the container.

Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as serious damage:

- (a) Discoloration when the plants are badly discoloured;
- (b) Insects when the plant is noticeably infested, or when it is seriously damaged by them;
- (c) Mildew, white rust or similar diseases when seriously affecting the edible quality or appearance of the plant; and,
- (d) Decay.

3.3 Leaves

3.3.1

similar varietal characteristics

the spinach shall be generally of one type, as crinkly leaf type, or flat leaf type. No mixture of varieties shall be permitted which materially affects the appearance of the lot

3.3.2

well-trimmed

the leafstems or petioles are not excessively long in relation to the size of the leafblades

3.3.3

damage

any defect which materially affects the appearance, or the edible or shipping quality of the individual leaves or of the lot as a whole

4 Provisions concerning quality

4.1 General

The purpose of the standard is to define the quality requirements for leafy vegetables at the export-control stage after preparation and packaging.

However, if applied at stages following export, products may show in relation to the requirements of the standard:

- (a) a slight lack of freshness and turgidity
- (b) a slight deterioration due to their development and their tendency to perish.

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder/seller shall be responsible for observing such conformity.

4.2 Minimum requirements

4.2.1 In all classes, subject to the special provisions for each class and the tolerances allowed, the leafy vegetables must be:

- (a) intact; leafy vegetables may be presented as single leaves or as rosettes; when presented as rosettes the outer leaves and roots may be removed
- (b) sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- (c) clean, practically free of any visible foreign matter; however, unwashed leafy vegetables (if indicated) may have traces of earth or other growing material
- (d) practically free from pests
- (e) practically free from damage caused by pests
- (f) fresh in appearance and turgescence
- (g) not running to seed, except for broccoli raab
- (h) free of abnormal external moisture
- (i) free of any foreign smell and/or taste.

4.2.2 The development and condition of the leafy vegetables must be such as to enable them:

- (a) to withstand transportation and handling
- (b) to arrive in satisfactory condition at the place of destination.

4.3 Classification

Leafy vegetables are classified in two classes, as defined below:

4.3.1 Class I

Leafy vegetables in this class must be of good quality. They must be characteristic of the variety and/or commercial type.

Leafy vegetables presented in rosettes must be trimmed. The roots must be cut underneath the rosette. The produce must be free from root tufts.

The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- (a) slightly damaged leaves, such as cracks, holes or tears

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- (b) slight defects in colouring.

4.3.2 Class II

This class includes leafy vegetables that do not qualify for inclusion in Class I but satisfy the minimum requirements specified above.

Leafy vegetables presented in rosettes may be untrimmed.

The following defects may be allowed, provided the leafy vegetables retain their essential characteristics as regards the quality, the keeping quality and presentation:

- (a) damaged leaves, such as cracks, bruises, holes or tears
- (b) defects in colouring
- (c) slight lack of freshness
- (d) small root tufts
- (e) slight ribbiness.

5 Provisions concerning sizing

There is no sizing requirement for leafy vegetables.

6 Provisions concerning tolerances

At all marketing stages, tolerances in respect of quality shall be allowed in each lot for produce not satisfying the requirements of the class indicated.

6.1 Quality tolerances

6.1.1 Class I

A total tolerance of 10 per cent, by weight, of leafy vegetables not satisfying the requirements of the class but meeting those of Class II is allowed. Within this tolerance not more than 1 per cent in total may consist of produce satisfying neither the requirements of Class II quality nor the minimum requirements, or of produce affected by decay. In addition, 10 per cent, by weight, of single leaves are allowed when presented as rosettes.

6.1.2 Class II

A total tolerance of 10 per cent, by weight, of leafy vegetables satisfying neither the requirements of the class nor the minimum requirements is allowed. Within this tolerance not more than 2 per cent in total may consist of produce affected by decay. In addition, 20 per cent, by weight, of single leaves is allowed when presented as rosettes.

7 Provisions concerning presentation

7.1 Uniformity

The contents of each package must be uniform and contain only leafy vegetables of the same origin, variety or commercial type and quality.

In Class I, leafy vegetables must be uniform in shape and colour.

However, a mixture of leafy vegetables of distinctly different species may be packed together in a sales package, provided they are uniform in quality and, for each species concerned, in origin.

The visible part of the contents of the package must be representative of the entire contents.

7.2 Packaging

Leafy vegetables must be packed in such a way as to protect the produce properly.

The materials used inside the package must be clean and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications, is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Packages must be free of all foreign matter.

8 Marking and labelling

8.1 Consumer packages

In addition to the requirements of ARS 56, the following specific provisions apply:

8.1.1 Nature of produce

- (a) "Watercress", "rocket", "spinach", "turnip tops", "turnip greens", "broccoli raab", "chard" if the contents are not visible from the outside
- (b) "Mixture of leafy vegetables", or equivalent denomination, in the case of a mixture of leafy vegetables of distinctly different species.

8.1.2 Consumer information

- (a) Class
- (b) "Unwashed", where appropriate
- (c) "Wash before use" (optional).

8.2 Non-retail containers

Each package¹ must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:

8.2.1 Identification

The exporter, packer and/or dispatcher shall be identified by name and physical address (e.g. street/city/region/postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority.²

8.2.2 Nature of produce

- (a) "Watercress", "rocket", "spinach", "turnip tops", "turnip greens", "broccoli raab", "chard" if the contents are not visible from the outside

¹ Package units of produce prepacked for direct sale to the consumer shall not be subject to these marking provisions but shall conform to the national requirements. However, the markings referred to shall in any event be shown on the transport packaging containing such package units.

² The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark, and the code mark should be preceded by the ISO 3166 (alpha) country/area code of the recognizing country, if not the country of origin.

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- (b) "Mixture of leafy vegetables", or equivalent denomination, in the case of a mixture of leafy vegetables of distinctly different species.

8.2.3 Origin of produce

Country of origin and, optionally, district where grown or national, regional or local place name.

8.2.4 Commercial specifications

- (a) Class
- (b) "Unwashed", where appropriate
- (c) "Wash before use" (optional).

8.2.5 Official control mark (optional)

9 Contaminants

9.1 Pesticide residues

Leafy vegetables shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

9.2 Other contaminants

Leafy vegetables shall comply with those maximum levels for contaminants established by the Codex Alimentarius Commission for this commodity.

10 Hygiene

10.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of ARS 53, CAC/RCP 53, and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

10.2 The produce should comply with any microbiological criteria established in accordance with CAC/GL 21.



Fresh spinach leaves



Growing spinach



New Zealand Spinach (Espinafre da Nova Zelândia)



New Zealand spinach



Red Vine Spinach



Red Vine Spinach

It has red veins (there are also with green veins) with meaty green leaf. It is a climbing vine. It is known as the Ceylon spinach, Indian spinach, Malabar Spinach, Red vine Spinach or simply known as Vine spinach and in Tamil it is Pasali Keerai. Apart from being a nutritious vegetable it could also be grown as an ornamental plant.



Producing spinach seed



Japanese mustard spinach



Mustard Spinach Mizuna



Japanese mustard spinach



Mizuna spinach

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